

38. The modified protein allergen of claim 37 wherein about 10 to 17 % of the amino acids have been modified in all the IgE epitopes of the natural protein allergen.
39. The modified protein allergen of claim 37 wherein the at least one IgE epitope is one that is recognized when the natural protein allergen is contacted with a pool of sera IgE taken from a group of at least two individuals that are allergic to the natural protein allergen.
40. The modified protein allergen of claim 37 wherein at least one modified amino acid is located within a central portion of the at least one IgE epitope, the central portion including about 40 % of the amino acids of the at least one IgE epitope.
41. The modified protein allergen of claim 37 wherein at least one amino acid in the at least one IgE epitope of the natural protein allergen has been modified by substitution.
42. The modified protein allergen of claim 41 wherein at least one hydrophobic amino acid in the at least one IgE epitope of the natural protein allergen has been substituted by a neutral or hydrophilic amino acid.
43. The modified protein allergen of claim 37 wherein the modified protein allergen retains the ability to activate T cells.
44. The modified protein allergen of claim 37 wherein the modified protein allergen retains the ability to bind IgG.
45. The modified protein allergen of claim 37 wherein the modified protein allergen retains the ability to initiate a Th1-type response.

sub 46
D2
46. The modified protein allergen of claim 37 wherein the modified protein allergen is a portion of the natural protein allergen.

47. In combination, the modified protein allergen of claim 37 and an adjuvant selected from the group consisting of IL-12, IL-16, IL-18, IFN γ , and immune stimulatory oligodeoxynucleotide sequences containing unmethylated CpG motifs which cause brisk activation and skew the immune response to a Th1-type response.

48. The modified protein allergen of claim 37 wherein the modified protein allergen is made in a transgenic plant or animal.

49. The modified protein allergen of claim 37 expressed in a recombinant host selected from the group consisting of plants and animals.

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50. The modified protein allergen of claim 37 expressed in a recombinant host selected from the group consisting of bacteria, yeast, fungi, and insect cells.

sub 51
D3
51. The modified protein allergen of claim 37 wherein the natural protein allergen is obtained from a source selected from the group consisting of legumes, milks, grains, eggs, fish, crustaceans, mollusks, insects, molds, dust, grasses, trees, weeds, mammals, and natural latexes.

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52. The modified protein allergen of claim 37 wherein the natural protein allergen is a peanut protein selected from the group consisting of Ara h 1, Ara h 2, and Ara h 3.

sub 53
D4
53. The modified protein allergen of claim 37 made by the process of:
identifying at least one IgE epitope in a natural protein allergen;

preparing at least one modified protein allergen whose amino acid sequence is substantially identical to that of a natural protein allergen except, that about 10 to 17 % of the amino acids have been modified in the at least one IgE epitope;

screening for IgE binding to the modified protein allergens by contacting the modified protein allergens with serum IgE taken from at least one individual that is allergic to the natural protein allergen; and

selecting a modified protein allergen with decreased binding to IgE as compared to the natural protein allergen.

54. In combination, a natural protein allergen and a masking compound, the masking compound being covalently or non-covalently bound to at least one IgE epitope of the natural protein allergen in such a way that IgE binding is reduced as compared with IgE binding to the natural protein allergen in the absence of the masking compound, wherein the at least one IgE epitope is one that is recognized when the natural protein allergen is contacted with serum IgE in the absence of the masking compound, the serum IgE taken from an individual that is allergic to the natural protein allergen.
55. The combination of claim 54 wherein the at least one IgE epitope is one that is recognized when the natural protein allergen is contacted with a pool of sera IgE taken from a group of at least two individuals that are allergic to the natural protein allergen.
56. The combination of claim 54 wherein the masking compound is an antibody that binds non-covalently to the at least one IgE epitope.
57. The combination of claim 54 wherein the combination retains the ability to activate T cells.
58. The combination of claim 54 wherein the combination retains the ability to bind IgG.